

Economics for the Anthropocene
Economics and Economics for the Anthropocene
Economics and Finance
Fall Seminar 2016
Working Syllabus

Class meetings: Tuesdays 2:30-5:30 p.m., online (via Adobe connect)

First class: Tuesday September 6th, 2016

Last class: Tuesday, November 29th, 2016 (13 classes total)

Student seminar organizers: Ben Dube (UVM), Caleb Gingrich (McGill), Joe Ament (UVM), Romain Svartzman (McGill)

Faculty Advisors: Josh Farley (UVM), Peter Victor (York)

Mentors: John Fullerton (Capital Institute)

Visiting Speakers: John Fullerton, Josh Farley, Peter Victor, David Powell (NEF), Brett Dolter, Alain Grandjean, Eric Pineault, Karine Péloffy, Damon Matthews, Emanuele Campiglio, Antoine Godin, Andrew Jackson, Gordon Laxer, Jeff Rubin

Research Question: What are the financial impacts of binding temperature agreements in the Anthropocene? How do we avoid or offset those impacts?

Sub-Questions – to be addressed in the final paper and subject to modifications:

- 1) How many assets should be stranded?
 - a. Is the \$27 trillion up-to-date?
- 2) Who are the winners and losers if certain assets are stranded?
 - a. From a micro/sectorial perspective (e.g. fossil fuels vs. renewable vs. manufacturing sectors)
 - b. From a macro perspective (e.g. pensioners, governments, indirect impacts and feedback loops)
- 3) Which types of assets should to be stranded?
 - a. Break out hydrocarbons
 - b. Break out geographies
 - c. Break out institutional investors
 - d. Other (intellectual patents for fossil-fuel-based technology, specific land uses, processing facilities, water, etc.

Evaluation Criteria:

40% Seminar Member Participation

 20% Peer Evaluation

 20% Mentor Evaluation

40% Final Paper (due 12/16)

 20% Individual Contribution

 20% Final Group Collaboration

20% Weekly Reading Lead

10% Lead 1

10% Lead 2

Final Paper: Drawing on cohort one's decision-making paper, the final paper will broadly analyze the stranded assets issue. It will draw on all the readings in order to consider the risk that stranding assets poses, and what must be done in order to obviate that risk.

OUTLINE OF THE SEMINAR

Introduction

- Videos from the 2015 [Oxford conference](#) on stranded assets and the environment
- Jakob, M. and Hilaire, J. (2015). Climate Science: Unburnable fossil-fuel reserves. Nature 517, 150-152.
- Articles:
 - o [Preventing a carbon bubble crash](#) - ABC
 - o [Fossil fuel-free index will help investors manage climate risks](#) - Forbes
 - o [On 'unburnable carbon' and the specter of a 'carbon bubble'](#) - NYT
 - o [New York: Where the carbon bubble threat goes mainstream?](#) – Climate Change News
 - o [Climate change study says most of Canada's oil reserves should be left underground](#) – CBC
 - o [The \\$2 trillion stranded assets danger zone: How fossil fuel firms risk destroying investor returns](#) – Carbon Tracker Initiative
 - o [Breaking the tragedy of the horizon - climate change and financial stability](#) - Speech by Mark Carney, Governor of the Bank of England

Part One: State of the World

Week 1-2 (Sept 6 and 13): Ecological Economics and Decision Making

Visitor: Josh Farley (Week 2)

Readings:

- Gowdy, J., and J. Erickson (2005). The approach of ecological economics. Cambridge Journal of Economics 29, 207-222.
- Water Cohort Decision Making Paper
 - <http://insideenergy.org/2014/12/22/ie-questions-what-are-unproved-reserves-and-why-should-you-care/>

Week 3 (Sept 22): Carbon Budgets

Visitor:

Readings:

Matthews, D. (2015). Quantifying historical carbon and climate debts among nations. *Nature Climate Change*.

Matthews, H.D. (2014). A growing commitment to future CO2 emissions. *Environ. Res. Lett.* 9, 111001.

Goulder, L.H., Hafstead, M.A., and Dworsky, M. (2010). Impacts of alternative emissions allowance allocation methods under a federal cap-and-trade program. *J. Environ. Econ. Manag.* 60, 161–181. - BEN

Rive, N., and Fuglestedt, J.S. (2008). Introducing population-adjusted historical contributions to global warming. *Glob. Environ. Change* 18, 142–152. - ROMAIN

Tavoni, Massimo, and Detlef P. Van Vuuren. "Regional Carbon Budgets: Do They Matter for Climate Policy?." (2015). - JOE

Pickering, J. & Barry, C. On the concept of climate debt: Its moral and political value. *Crit. Rev. Int. Soc. Polit. Phil.* 15, 667_685 (2012). - CALEB

Week 4 (Sept 29): Embedded Carbon

Visitor: Brett Dolter

Readings:

- Dolter Paper
- Herman Daly, OPEC and Sustainable Development <http://www.hubbertpeak.com/daly/opecsustdev.pdf>
- Aldy, J. E., et al. (2003). Thirteen plus one: a comparison of global climate policy architectures. *Climate Policy*, 3(4), 373-397. <http://dx.doi.org/10.1016/j.clipol.2003.09.004> (Romain)
- To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming, Nordhaus, *Rev Environ Econ Policy* (2007) 1(1): 26-44.doi: 10.1093/reep/rem008 (Ben)
- Regulation by Prices, Quantities, or Both: A Review of Instrument Choice, Cameron Hepburn, *Oxf Rev Econ Policy* (Summer) 22(2): 226-247.doi: 10.1093/oxrep/grj014 (Joe)
- Konidari, P., & Mavrakis, D. (2007). A multi-criteria evaluation method for climate change mitigation policy instruments. *Energy Policy*, 35(12), 6235-6257. (Caleb) <http://www.sciencedirect.com/science/article/pii/S0301421507003229>

Week 5-7 (Oct 6, 13, and 20): Stranded Hydrocarbon Assets

Visitor: John Fullerton (potentially 10/20), , Eric Miller (October 6)

Readings:

- Ansar, A., Caldecott, B., and Tilbury, J. (2013). Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets. Stranded Assets Programme SSEE Univ. Oxf. (Joe)
 - Rozenberg, J., Vogt-Schilb, A., and Hallegatte, S. (2014). Transition to clean capital, irreversible investment and stranded assets. World Bank Policy Res. Work. Pap. (ROMAIN)
 - Unburnable Carbon 2011: Are the world's financial markets carrying a carbon bubble? <https://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf> (ALL)
 - Unburnable Carbon 2013: Wasted capital and stranded assets. <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-2-Web-Version.pdf> (ALL)
 - Fyke, J., and Matthews, H.D. (2015). A probabilistic analysis of cumulative carbon emissions and long-term planetary warming. Environ. Res. Lett. 10, 115007.
 - Caldecott, Ben, James Tilbury, and Christian Carey. "Stranded assets and scenarios." Smith School of Enterprise and the Environment, University of Oxford. [http://www.smithschool.ox.ac.uk/research-programmes/strandedassets/Stranded%20Assets%20and%20Scenarios\(2014\)](http://www.smithschool.ox.ac.uk/research-programmes/strandedassets/Stranded%20Assets%20and%20Scenarios(2014)).
- John Fullerton's Article on Stranded Asset Bubble: <http://capitalinstitute.org/blog/big-choice-0/>
- Michael Hudson: <http://michael-hudson.com/2010/07/from-marx-to-goldman-sachs-the-fictions-of-fictitious-capital1/>

Part Two: Transition

Week 8-9 (Oct 27, Nov 3): Winners and Losers Globally and Locally: Britain vs USA vs. Canada

Visitor: Gordon Laxer in Week 9, Andrew Jackson (U. Surrey), Jeff Rubin

Readings:

- Unburnable Carbon 2011 (pp. 10-14), Unburnable Carbon 2013 (pp. 17-20)
- Laxer, G. (2015). After the sands – Energy and Ecological Security for Canadians. Douglas&McIntyre. Chapter 5 and chapters 8-10
- Stranded Carbon Assets: Why and How Carbon Risks Should be Incorporated in Investment Analysis. The Generation Foundation
- The Price of Climate Change: Global Warming's Impact on Portfolios. BlackRock White Paper

- NEF Unburnable Carbon Paper
- Paper by Andrew Jackson (U. of Surrey) – to come. On modeling the future macroeconomic impacts of stranded assets through stock-flow consistent (SFC) models
- Jeff Rubin – The carbon bubble: what happens to us when it bursts. Chapters 11-15 (pp 154-245)
- Jackson, T. (2009). Prosperity Without Growth: Economics for a Finite Planet. Earthscan. Chapter 5 ('The myth of decoupling')

Week 10 (Nov 10): Other Assets to Strand?

Visitor: Karine Peloffy - GORDON LAXER HAS ALREADY CONFIRMED FOR THIS DATE (SEE WITH ROMAIN IF NEEDED)

Readings:

- Caldecott, Ben, Nicholas Howarth, and Patrick McSharry. "Stranded assets in agriculture: Protecting value from environment-related risks." Smith School of Enterprise and the Environment, University of Oxford, Oxford, United Kingdom (2013).
- Woo, C.K., Lloyd, D., Karimov, R., and Tishler, A. (2003). Stranded cost recovery in electricity market reforms in the US. Energy 28, 1–14.

Part Three: The Future

Week 11 (Nov 17): Ethics for a stranded-assets society?

Visitor: Ethics Group

Readings:

- Klein, N. (2014). This Changes Everything - Conclusion
- Knutti, R., and Rogelj, J. (2015). The legacy of our CO2 emissions: a clash of scientific facts, politics and ethics. Clim. Change 133, 361–373.

Week 12 (Nov 24): Institutions for a stranded-assets society?

Visitor: Law and Governance Group

Readings:

- Farley, J., Costanza, R., Flomenhoft, G., & Kirk, D. (2015). The Vermont Common Assets Trust: An institution for sustainable, just and efficient resource allocation. Ecological Economics, 109, 71–79.

- Klein, N. (2014). This Changes Everything. Chapters 3 ('Public and paid for') and 5 ('Beyond extractivism')
- Ostrom, E. (2010). Beyond markets and states: polycentric governance of complex economic systems, 3895(812), 641–672
- Jackson, T. (2009). Prosperity Without Growth: Economics for a Finite Planet. Earthscan. Chapters 11-12

Week 13 (Dec 1): Monetary Systems for a Stranded Asset Society

Visitor: Josh Farley

Readings:

Farley, J., Burke, M., Flomenhoft, G., Kelly, B., Murray, D., Posner, S. and Witham, A. (2013). Monetary and Fiscal Policies for a Finite Planet. Sustainability, 5(6), 2802–2826.

Lawn, P. (2010). Facilitating the transition to a steady-state economy: Some macroeconomic fundamentals. Ecological Economics, 69(5), 931–936.

Forstater, M. (2001). Full Employment and Environmental Sustainability, (Working Paper No. 13). Center for Full Employment and Price Stability, University of Missouri-Kansas City.

Other Readings:

Brown, L. (2015). The Great Transition: Shifting From Fossil Fuels To Wind And Solar Energy.

Ferng, J.-J. Allocating the responsibility of CO₂ over-emissions from the perspectives of benefit principle and ecological deficit. Ecol. Econ. 46, 121_141 (2003).

Goeminne, G. & Paredis, E. The concept of ecological debt: Some steps towards an enriched sustainability paradigm. Environ. Dev. Sustain. 12, 691_712 (2009).

Kanitkar, T., Jayaraman, T., D'Souza, M., and Purkayastha, P. (2013). Carbon budgets for climate change mitigation- a GAMS-based emissions model. *Curr. Sci.* 104, 1200–1206.

Lee, M. and Ellis, B. (2013). Implications of stranded fossil fuel assets for financial markets and pension funds. Canadian Centre for Policy Alternatives.

MacDougall, A.H., Zickfeld, K., Knutti, R., and Matthews, H.D. (2015). Sensitivity of carbon budgets to permafrost carbon feedbacks and non-CO₂ forcings. *Environ. Res. Lett.* 10, 125003.

Meinshausen, M., Meinshausen, N., Hare, W., Raper, S.C.B., Frieler, K., Knutti, R., Frame, D.J., and Allen, M.R. (2009). Greenhouse-gas emission targets for limiting global warming to 2 °C. *Nature* 458, 1158–1162.

Peters, G.P., Andrew, R.M., Solomon, S., and Friedlingstein, P. (2015). Measuring a fair and ambitious climate agreement using cumulative emissions. *Environ. Res. Lett.* 10, 105004.

Rogelj, J., Reisinger, A., McCollum, D.L., Knutti, R., Riahi, K., and Meinshausen, M. (2015a). Mitigation choices impact carbon budget size compatible with low temperature goals. *Environ. Res. Lett.* 10, 075003.

Rogelj, J., Meinshausen, M., Schaeffer, M., Knutti, R., and Riahi, K. (2015b). Impact of short-lived non-CO₂ mitigation on carbon budgets for stabilizing global warming. *Environ. Res. Lett.* 10, 075001.

Rozenberg, J., Davis, S., Narloch, U. and Hallegatte, S. (2015). Climate constraints on the carbon intensity of economic growth. *Environmental Research Letters* 10.

Stern, D.I., Pezzey, J.C., and Lambie, N.R. (2012). Where in the world is it cheapest to cut carbon emissions?*. *Aust. J. Agric. Resour. Econ.* 56, 315–331.

Zickfeld, K., Arora, V.K., and Gillett, N.P. Is the climate-carbon cycle response to CO₂ emissions path dependent?